Abstract

It has been discovered that when pluripotent stem cells are cultured in the presence of a hepatocyte differentiation agent, a population of cells is derived that has a remarkably high proportion of cells with phenotypic characteristics of liver cells. In one example, human embryonic stem cells are allowed to form embryoid bodies, and then combined with the differentiation agent n-butyrate, optionally supplemented with maturation factors. In another example, n-butyrate is added to human embryonic stem cells in feeder-free culture. Either way, a remarkably uniform cell population is obtained, which is predominated by cells with morphological features of hepatocytes, expressing surface markers characteristic of hepatocytes, and having enzymatic and biosynthetic activity important for liver function. Since stem cells readily proliferate in culture, this system provides an abundant source of cells of the hepatocyte lineage for a variety of applications, such as drug screening, and replenishing liver function in the context of clinical treatment.